**Remarks:**

Reconsideration of the application is respectfully requested.

Applicant gratefully acknowledges the suggestions made by the Examiner in the Advisory Action mailed July 31, 2007 (the "**Advisory Action**") for getting the claims in condition for allowance. Applicant has amended claims 1 and 11, herein, to address the suggestions made in the **Advisory Action**. Additionally, since the amendments made to claims 24 and 26 in the prior Response were not entered, they are being re-presented, herein.

Claims 1 - 6 and 10 - 26 are presently pending in the application. Claims 1, 13, 24 and 26 have been amended. Claims 7 - 9 were previously canceled.

In item 2 of the final Office Action mailed May 9, 2007 (the "**final Office Action**"), the specification was objected to because certain claims had been amended to recite a state unit "includes an electrical **capacitor**". Applicant has amended claims 1 and 13 to recite that the state unit includes, among other things, "an electrical **capacitance**". The amendment to recite such an electrical capacitance is supported by the specification of the instant application, for example, on page 8 of the instant application, which states, in part:

> Fig. 2 shows a schematic representation of a first embodiment of the present invention. This embodiment follows the approach of storing electrical energy in a capacitor. **The state unit comprises a capacitor, or a unit 30 with an electrical capacitance**, and a clock generator 32 which are actively connected to each other and to the computation unit 12. In an initial state the unit 30 with an electrical capacitance carries no charge. When an operation is performed by the computation unit 12 the electrical capacitance 30 is charged up under the control of a switching event of a FET. By using this capacitor as the frequency control element of an oscillator or PLL divider which serves as the clock for the circuit element, i.e. the crypto-processor or crypto-coprocessor, the coupling with the operating speed can be achieved simply. [emphasis added by Applicant]

As shown above, the specification provides proper support for the "electrical capacitance" of current claims 1 and 13. As such, it is respectfully requested that the objection to the specification on page 2 of the **final Office Action** be withdrawn.

Additionally in item 2 of the **final Office Action**, claim 26 was objected to for reciting a "calculation unit", instead of a "computation unit". Both of claims 24 and 26 have been amended herein to replace the recited "calculation unit" with a "computation unit", as suggested on page 2 of the **final Office Action**.

As such, Applicant's specification and claims are believed to overcome the objections made on page 2 of the **final Office Action**.

In item 3 of the **final Office Action**, claims 1 - 6 and 10 - 14 were rejected under 35 U.S.C. § 112, first paragraph, allegedly, for the same objection as was made to the specification in item 2 of the **final Office Action**. As such, Applicant believes that the amendments to claims 1 and 13 also address the rejection of claims 1 - 6 and 10 - 14, made in item 3 of the **final Office Action**.

Applicant notes that the Advisory Action indicated, in part:

> However, if the applicant amends the independent claims to recite the subject matter that is discloses [sic] in paragraph [0025] of the instant specification, the claims would overcome 35 USC 112 rejection.

Paragraph [0025] of the instant application, states:

> **The arrow 34 represents the charging of the electrical capacitance 30 initiated by execution of an operation in the computation unit 12.** Each time an operation is executed by the computation unit 12, the charge on the electrical capacitance 30 is increased by a specified amount. The charge contained in the electrical capacitance 30 is thus a direct measure of the number of operations executed by the computation unit 12. Depending on the size of this charge, a frequency of a clock generation by the clock generator 32 for the computation unit 12 is so controlled (arrow 36) that the greater the charge of the electrical capacitance 30 is, the lower is the frequency of the clock generation. Since the clock generated by the clock generator 32, or its frequency, directly influences the speed of execution of an operation by the computation unit 12 (arrow 38), this means that the speed of execution of an operation by the computation unit 12 gets slower and slower as the number of

> operations performed by the computation unit 12 increases. [emphasis added by Applicant]

As stated above, Applicant has amended claims 1 and 13 to recite that the state unit includes, among other things, "an electrical **capacitance**". As such, paragraph [0025] of the instant application further supports the amendments to claims 1 and 13.

As such, Applicant's amended claims are believed to meet the requirements of 35 U.S.C. § 112, first paragraph.

In item 5 of the **final Office Action**, claims 1 - 6 and 10 - 26 were rejected on the ground of nonstatutory obviousness-type double patenting. However, Applicant gratefully acknowledges that the **Advisory Action** indicated, in part:

> Examiner further directs applicant's attention with respect to Double patenting rejections **which has been withdrawn**. [emphasis added by Applicant]

As such, in view of the arguments made in the response filed on July 9, 2007 (the "**prior response**"), that response being incorporated herein, by reference, in its entirety, and in view of the statement made in the **Advisory Action** indicating that the Double Patenting rejection was **withdrawn**, Applicant believes that the claims of the instant application are

patently distinct from the claims of U. S. Patent No. 6,999,333.

In item 6 of the **final Office Action**, claims 1 - 6 and 10 - 26 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U. S. Patent No. 6,330,668 to Curiger et al ("**CURIGER**")

Applicant respectfully traverses the above-rejections.

I. **The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, charging of an electrical capacitance being initiated by an execution of an operation in the computation unit and a variable that is a charge quantity of said electrical capacitance, as required by Applicant's claims 1 and 13.**

The Advisory Action indicated, in part:

> However, if the applicant would amend the claims to recite " . . . a variable, wherein the variable is a charge quantity" and with the amendedment [sic] that is already suggested above, **the amended claims will overcome cited prior art rejection as well.** [emphasis added by Applicant]

As stated above, paragraph [0025] of the instant application, states:

> **The arrow 34 represents the charging of <u>the electrical capacitance 30</u> initiated by execution of an operation in the computation unit 12.** Each time an operation is executed by the computation unit 12, the charge on the electrical capacitance 30 is increased by a specified amount. The charge contained in the electrical

> capacitance 30 is thus a direct measure of the number of operations executed by the computation unit 12. Depending on the size of this charge, a frequency of a clock generation by the clock generator 32 for the computation unit 12 is so controlled (arrow 36) that the greater the charge of the electrical capacitance 30 is, the lower is the frequency of the clock generation. Since the clock generated by the clock generator 32, or its frequency, directly influences the speed of execution of an operation by the computation unit 12 (arrow 38), this means that the speed of execution of an operation by the computation unit 12 gets slower and slower as the number of operations performed by the computation unit 12 increases. [emphasis added by Applicant]

As such, Applicant has amended claim 1 of the instant application to recite, among other limitations:

> wherein said state unit includes an electrical capacitance and **said variable is a charge quantity of said electrical capacitance**; and
>
> **a charging of said electrical capacitance being initiated by an execution of an operation in the computation unit.** [emphasis added by Applicant]

Similarly, Applicant's independent claim 13 was amended to recite, among other limitations:

> wherein **the variable is a charge quantity of an electrical capacitance**; and
>
> **wherein the charging of the electrical capacitance is initiated by an execution of an operation in the computation unit.** [emphasis added by Applicant]

In addition to paragraph [0025] of the instant application, the further amendments to claims 1 and 13 are supported by the specification of the instant application. For example, it is

clear from the description of Fig. 2 of the instant application, that **variable the charge quantity of the electrical capacitance is the variable recited in original independent claims 1 and 13.** See, for example, paragraph [0025] of the present application, which states, in part:

> **The charge contained in the electrical capacitance 30 is thus a direct measure of the number of operations executed** by the computation unit 12. **Depending on the size of this charge**, a frequency of a clock generation by the clock generator 32 for the computation unit 12 is so controlled (arrow 36) that the greater the charge of the electrical capacitance 30 is, the lower is the frequency of the clock generation. [emphasis added by Applicant]

As such, it is believed that no new matter was added by way of the above amendments to claims 1 and 13.

It is further believed that the **CURIGER** reference, cited in the **final Office Action**, does not teach or suggest the above limitations of Applicant's claims 1 and 13, among others. See, for example, the arguments set forth in the **prior Response**. Applicant's belief is supported by the indication in the **Advisory Action** that the amended claims would be patentable over the cited prior art if the above amendments were made.

As such, Applicant's claims 1 - 6 and 10 - 14 are believed to be patentable over the **CURIGER** reference.

**II. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, a thermal capacitance having a second temperature, wherein the speed of the computation unit is also controlled according to the second temperature, as required by Applicant's claim 15.**

Applicant's independent claim 15 recites, among other limitations:

> a state unit, which has a state, **wherein the speed of the computation unit is controllable according to the state of the state unit, wherein the state unit is designed to cause an increase of a variable by which the state of the state unit can be represented in response to the execution of an operation by the computation unit,** and to decrease the speed of the computation unit in response to the increase of the variable due to executing of the operation,
>
> wherein the state unit includes a unit with a thermal capacitance;
>
> **wherein the state is a temperature of the unit;**
>
> **wherein the unit with a thermal capacitance also has a second temperature;** and
>
> **wherein the speed of the computation unit is also controlled according to the second temperature.**
> [emphasis added by Applicant]

The Office Action stated that the above limitations of Applicant's claim 15 are allegedly disclosed in col. 4 of **CURIGER**, lines 15 - col. 5, line 55.

Applicant respectfully disagrees.

Applicant's independent claim 15 recites, among other limitations, that **the speed of the computation unit is controllable according to the state of the state unit, the state unit is designed to cause an increase of a variable by which the state of the state unit can be represented in response to the execution of an operation by the computation unit, and the state is a temperature of the unit.** Additionally, Applicant's claim 15 recites, among other limitations, that the state unit includes **a unit with a thermal capacitance having a second temperature, wherein the speed of the computation unit is also controlled according to the second temperature.**

As such, Applicant's claim 15 requires, among other things, that **the state unit have two separate temperatures that control the speed of the computation unit.**

However, in **CURIGER** , the oscillator of **CURIGER**, as well as the rest of the circuitry, should have **the same temperature**, such that the temperature impact on the oscillator is the same as the temperature impact on the rest of the circuitry. See, for example, col. 4 of **CURIGER** , lines 58 - 60). Based on this understanding, a person of ordinary skill in this art would understand it to be desirable, for the circuit of **CURIGER**, to maintain the oscillator and the rest of the circuits **at the**

**same temperature**. Thus, among other limitations of Applicant's claims, **CURIGER fails** to teach, suggest or motivate to a person of skill in the art, Applicant's invention of claim 15, of **providing two different temperatures that control the speed of the computation unit.**

As such, Applicant's independent claim 15 is believed to be patentable over the **CURIGER** reference.

**III. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, an electrical filament resistor, as required by Applicant's claim 20.**

Applicant's independent claim 20 recites, among other limitations:

> wherein the processor **comprises an electrical filament resistor adapted to supply energy to the thermal capacitance in response to the execution of an operation** in the computation unit.

The use of such an electrical filament resistor is supported by the specification of the instant application, for example, page 10 of the instant application, which states, in part:

> **In response to execution of an operation in the computation unit 12, energy is supplied to the thermal capacitance 50** (arrow 54), thus raising its temperature. **This can be achieved by using an electrical filament resistor**, preferably however through the waste heat of the computation unit 12

conveyed over a heat conducting connection. [emphasis added by Applicant]

However, item 6 of the Office Action, which rejects claim 20 over **CURIGER**, fails to even mention an electrical filament resistor, or where such an electrical filament resistor could, allegedly, be found in **CURIGER**. Applicant maintains that the **CURIGER** reference neither teaches, nor suggests, among other limitations of Applicant's claims, a processor **including an electrical filament resistor adapted to supply energy to the thermal capacitance in response to the execution of an operation** in the computation unit.

Further, **CURIGER** describes that the circuit is implemented in a CMOS silicon technology. See, for example, col. 4 of **CURIGER**, lines 56 - 60). It is well known that resistors are avoided in CMOS technology. Consequently, a person of ordinary skill in this art would, naturally, not include a filament resistor in the circuit of **CURIGER**.

Moreover, according to **CURIGER**, the heating of the circuit would be undesirable. Thus, a person of ordinary skill in the art, reading **CURIGER**, would, naturally, not use an electrical filament resistor in combination with the circuit of **CURIGER**. According to **CURIGER**, the heating of the silicon is an undesirable effect. In **CURIGER** , the oscillator of **CURIGER** ,

as well as the rest of the circuitry, should have the same temperature, such that the temperature impact on the oscillator is the same as the temperature impact on the rest of the circuitry. See, for example, col. 4 of **CURIGER** , lines 58 - 60). Based on this understanding, a person of ordinary skill in this art would understand it to be desirable, for the circuit of **CURIGER**, to maintain the oscillator and the rest of the circuits **at the same temperature**, which understanding would prevent a person of ordinary skill in this art from providing an electrical filament resistor, as required by Applicant's claim 20.

For the foregoing reasons, among others, Applicant's claim 20 is additionally believed to be patentable over the **CURIGER** reference.

**IV. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, an inversely proportional relationship between the speed of the computation unit and the variable representing the state of the state unit, and an output signal of a temperature sensor controlling the clock rate of a clock generator, as required by Applicant's claim 21.**

Applicant's independent claim 21 recites, among other limitations:

> a state unit, which has a state, wherein the speed of the computation unit is controllable according to the state of the state unit, wherein the state unit is

> designed to cause **an increase of a variable by which the state of the state unit can be represented in response to the execution of an operation** by the computation unit, **and to decrease the speed of the computation unit in response to the increase of the variable due to executing of the operation**; and
>
> . . .
>
> wherein the state is a temperature of the unit;
>
> **wherein the clock generator is adapted such that an output signal of the temperature sensor controls a clock rate generated by the clock generator;**
> [emphasis added by Applicant]

As fully discussed in the sections, above, **CURIGER** fails to teach or suggest, among other limitations of Applicant's claims, **an inversely proportional relationship between the speed of the computation unit and the variable, by which the state of the state unit can be represented, or an inversely exponential relationship between the speed of the computation unit and the variable, by which the state of the state unit can be represented.**

Further, **CURIGER** fails to teach or suggest, among other limitations of Applicant's claims, **a temperature sensor or a clock generator adapted such that an output signal of the temperature sensor controls a clock rate generated by the clock generator, as required by Applicant's claim 21**. Rather, in **CURIGER**, the ring oscillator **has a natural temperature dependence**, caused by the temperature dependent

characteristics **of the field effect transistors** disclosed in **CURIGER**. As such, among other limitations of Applicant's claims, **CURIGER** fails to teach or suggest Applicant's particularly claimed temperature sensor of claim 1. Nor does item 6 of the Office Action, which rejects claim 21 over **CURIGER**, even mention such a temperature sensor, as claimed in Applicant's claim 21.

For the foregoing reasons, among others, Applicant's claim 21 is additionally believed to be patentable over the **CURIGER** reference.

**V. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, an inversely proportional relationship between the speed of the computation unit and the variable representing the state of the state unit or wherein the state unit is so designed that the speed of the computation unit is inversely exponential to the variable, by which the state of the state unit can be represented, as required by Applicant's claim 22.**

Applicant's independent claim 22 recites, among other limitations:

> wherein the state unit is so designed that **the speed of the computation unit <u>is inversely proportional</u> to the variable**, by which the state of the state unit can be represented, **or**
>
> wherein the state unit is so designed that **the speed of the computation unit <u>is inversely exponential</u>** to

> **the variable**, by which the state of the state unit can be represented [emphasis added by Applicant]

As discussed in the sections above, **CURIGER** fails to teach or suggest, among other limitations of Applicant's claims, a state unit, which is so designed that the speed of the computation unit is inversely proportional to the variable, by which the state of the state unit can be represented, or wherein the state unit is so designed that the speed of the computation unit is inversely exponential to the variable, by which the state of the state unit can be represented.

For the foregoing reasons, among others, Applicant's claim 22 is additionally believed to be patentable over the **CURIGER** reference.

**VI. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, the presence of a clock generator adapted to change the speed of the computation unit in steps in dependence on the state of the state unit, as required by Applicant's claim 23.**

Applicant's independent claim 23 recites, among other limitations:

> wherein **the clock generator is adapted to change the speed of the computation unit in steps in dependence on the state of the state unit**, to set the speed of the computation unit to a first high speed or to a second lower speed. [emphasis added by Applicant]

As discussed in the sections above, **CURIGER** fails to teach or suggest, among other limitations of Applicant's claims, a state unit, which is adapted to change the speed of the computation unit **in steps**, in dependence on the state of the state unit, to set the speed of the computation unit to a first high speed or to a second lower speed.

More particularly, item 6 of the Office Action does not even allege that that **CURIGER** discloses a clock generator, **wherein the clock generator is adapted to change the speed of the computation unit in steps, in dependence on the state of the state unit**, as required by Applicant's claim 23. In fact, **CURIGER** discloses a ring oscillator, which is affected **in a continuous way** by the temperature. In **CURIGER**, this continuous impact is caused by the natural characteristic of the field effect transistor, described herein above. In contrast to the teachings of **CURIGER**, Applicant's independent claim 23 recites, among other limitations, **a step-wise change of the speed**, which is contrary to the teachings of **CURIGER**.

For the foregoing reasons, among others, Applicant's claim 23 is additionally believed to be patentable over the **CURIGER** reference.

**VII. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, setting a factor for a relationship between a state of the state unit and the speed of the calculation unit or for setting an amount of energy supplied to the state unit by means of a programmable parameter, as required by Applicant's claim 24.**

Applicant's independent claim 24 recites, among other limitations:

> wherein the processor is adapted to allow for **setting a factor for a relationship between a state of the state unit and a speed of the computation unit or for setting an amount of energy supplied to the state unit by means of a programmable parameter** [emphasis added by Applicant]

Item 6 of the Office Action fails to even allege that **CURIGER** teaches or suggests, among other limitations of Applicant's claims, a circuit, wherein the processor is adapted to allow for setting a factor for a relationship between a state of the state unit and the speed of the calculation unit, or for setting an amount of energy supplied to the state unit by means of a programmable parameter, as required by Applicant's claim 24. In fact, **CURIGER** specifically teaches that the oscillator and the rest of the circuit should be heated in the same way. Thus, **no means** for setting a factor for a relationship between a state of the state unit and the speed of the calculation unit, would make any sense with respect to the disclosure of **CURIGER**. This is due to the fact that according to **CURIGER, the speed of the oscillator should**

**change in the same way as the speed of the rest of the circuit**, in order to avoid the oscillator operating faster than the rest of the circuit of **CURIGER**. As such, **CURIGER**, fails to teach or suggest, among other limitations of Applicant's claims, a processor adapted to allow for setting a factor for a relationship between a state of the state unit and the speed of the calculation unit, or for setting an amount of energy supplied to the state unit by means of a programmable parameter, as required by Applicant's claim 24.

For the foregoing reasons, among others, Applicant's claim 24 is additionally believed to be patentable over the **CURIGER** reference.

**VIII. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, controlling a number of bits processed simultaneously, by an operation in the computation unit according to the state of the state unit, as required by Applicant's claim 25.**

Applicant's independent claim 25 recites, among other limitations:

> wherein **a number of bits which are processed simultaneously** by an operation in the computation unit **is controlled according to the state of the state unit**. [emphasis added by Applicant]

Item 6 of the Office Action fails to even allege that **CURIGER** teaches or suggests, among other limitations of Applicant's

claims, controlling a number of bits processed simultaneously, by an operation in the computation unit according to the state of the state unit, as required by Applicant's claim 25. In fact, **CURIGER** fails to teach or suggest such a feature. Instead, **CURIGER** tries to synchronize the speed of the oscillator and the speed of the computation unit, **but does not teach influencing the speed of the computation unit by setting the numbers of bits which are processed simultaneously.**

For the foregoing reasons, among others, Applicant's claim 25 is additionally believed to be patentable over the **CURIGER** reference.

**IX. The CURIGER reference fails to teach or suggest, among other limitations of Applicant's claims, the introduction of wait clock intervals to decrease the speed of the computation unit, as required by Applicant's claim 26.**

Applicant's independent claim 26 recites, among other limitations:

> a state unit, which has a state, wherein the speed of the computation unit is controllable according to the state of the state unit, wherein the state unit is designed to cause an increase of a variable by which the state of the state unit can be represented in response to the execution of an operation by the computation unit, and to decrease the speed of the computation unit in response to the increase of the variable due to executing of the operation,

**wherein wait clock intervals are introduced to decrease the speed of the computation unit.** [emphasis added by Applicant]

Item 6 of the Office Action fails to even allege that **CURIGER** teaches or suggests, among other limitations of Applicant's claims, **the introduction of wait clock intervals to decrease the speed of the computation unit**, as required by Applicant's claim 26. In fact, **CURIGER** neither teaches, nor suggests such a limitation, as **CURIGER** intends that the speed of the oscillator be synchronized with the speed of the computation unit.

For the foregoing reasons, among others, Applicant's claim 26 is additionally believed to be patentable over the **CURIGER** reference.

**X. Conclusion.**

It is accordingly believed that none of the references, whether taken alone or in any combination, teach or suggest the features of claims 1, 13, 15 and 20 - 26. Claims 1, 13, 15 and 20 - 26 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 1 and 15.

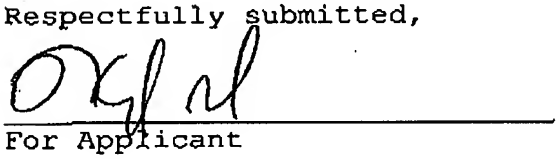
In view of the foregoing, reconsideration and allowance of claims 1 - 6 and 10 - 26 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out. In the alternative, the entry of the amendment is requested, as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner Greenberg Stemer LLP, No. 12-1099.

Respectfully submitted,



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August 8, 2007

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